

**REMARKS**

This Amendment, filed in reply to the Office Action dated March 21, 2007, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

Claims 1-8, 17 and 18 are pending in the application.

**I. Claim Rejections - 35 USC § 112**

Claims 4-8 are rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Examiner alleges that it is unclear what the variables in claim 4 are intended to represent.

Applicant submits that “ $\mu$ ”, “ $\sigma_\epsilon$ ”, “ $\sigma_\beta$ ”, “ $\lambda$ ” are parameters indicative of distribution of  $\alpha$ ,  $\epsilon$ ,  $\beta$  showing in the equation (3) in the specification. Each parameter with a hat symbol (^) represents a parameter after the estimate.

With the parameter being estimated based on  $(\mu_0, \mu_1, \sigma_0, \sigma_1)$  of one-dimensional mixed normal distribution (25) in the specification,  $\mu$ ,  $\sigma_\epsilon$ ,  $\sigma_\beta$ ,  $\lambda$  are calculated.

In view of the foregoing, Applicant respectfully requests that the Examiner withdraw the rejections of claims 4-8 under 35 U.S.C. § 112, second paragraph.

**II. Claim Rejections - 35 USC § 103**

Claims 1, 17, and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McLachlan et al. (The EMMIX software for the fitting of mixtures of normal and t-Components and the user's guide to EMMIX-version 1.3 1999, Journal of Statistical Software. Vol. 4(2), p. 1-14, 12 July 1999, (hereinafter “McLachlan 1999”) or McLachlan et al. (Bioinformatics Vol. 18,

No. 3, p. 413-422, 2002) (hereinafter “McLachlan 2002”), in view of Peel et al. (Statistics and Computing, Vol. 10, p. 339-348, 2000) (hereinafter “Peel”) and further in view of Lee et al. (PNAS, Vol. 97, No. 18, p. 9834-9839, 2000) (hereinafter “Lee”). Applicant respectfully traverses the rejections for the following reasons.

In McLachlan 1999,  $\phi(y; \mu_i, \Sigma_i)$  denotes the multivariate normal probability density function with mean  $\mu_i$  and covariance matrix  $\Sigma_i$ . Since  $f(y; \Psi) = \sum_{i=1}^g \pi_i c_i(y; \theta_i)$  covariance matrix is estimated in McLachlan 1999, the distribution in interest is at least two-dimensional. In contrast, according to the present invention, the equation (25) is for estimating distributed parameter of a one-dimensional normal distribution.

McLachlan 2002, Peel and Lee do not remedy the deficiencies of McLachlan 1999 with respect to claim 1.

With further regard to Lee, the equation [1] in Lee represents mathematical model which performs the modeling for the presence or absence (two states) of gene expression for one sample (one fluorescent dye). Lee neither discloses nor teaches the technical feature of the present invention that the modeling (for example, the equations (5) to (10)) is performed for presence or absence (four states) of gene expression for two samples (two fluorescent dyes).

The equation (25) of this invention and the equation [1] in Lee are the same in the form. However, the equation [1] in Lee is applied to the amount of expression of gene for one sample. In contrast, in the present invention, the equation (25) is applied to the sum of the amount of expression of gene of two samples.

Lee neither teaches nor suggests the modeling for the presence or absence (four states) of gene expression for two samples. In the present invention, the modeling is performed for

presence or absence (four states) of gene expression for two samples (two fluorescent dyes) using two-dimensional normal distribution (four components).

In view of the foregoing reasons, claim 1 should be patentable. The above comments are submitted in substantially equal force, by analogy to claims 17 and 18 in view of the similarities between claim 1, and claims 17 and 18.

Claims 2 and 3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McLachlan 1999 or McLachlan 2002, in view of Peel and further in view of Lee as applied to claim 1 above, and further in view of Pan et al. (Genome Biology, vol. 3, not, p. research 0009.1-0009.8, 29 Jan 2002 (hereinafter "Pan")).

Claims 2 and 3 should be patentable at least because of its dependency from claim 1, and because McLachlan 2002, Peel, Lee and Pan do not remedy the deficiencies of McLachlan 1999 with respect to claim 1.


### **III. Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Appln. No. 10/766,011  
Attorney Docket: Q79665

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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Date: August 21, 2007